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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/982,980 | 10/22/2001 | Myung Cheol Yoo | 9323.013.00 | 7233 |

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EXAMINER

ROCCHEGIANI, RENZO

| | |
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| ART UNIT | PAPER NUMBER |
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2825

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/982,980

Applicant(s)

YOO, MYUNG CHEOL *YC*

Examiner

Renzo N. Rocchegiani

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-78 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,379,985 B1 (Carvantes et al.) in view of U.S. Patent No. 5,103,269 (Tomomura et al.).

Carvantes et al. discloses a method to form a plurality of light emitting diodes (col. 3, lines 30-35) that have a transparent substrate comprising the steps of depositing a buffer layer over a sapphire substrate (col. 3, lines 30-33 & col. 10, lines 38-49 & Fig. 14), depositing an n-type GaN layer over the buffer layer (col. 10, lines 50-55 & Fig. 14), depositing a InGaN active layer over the n-type layer (col. 10, lines 55-63 & Fig. 14), depositing a p-type GaN layer over the active layer (col. 10, lines 63-67 & Fig. 14), depositing a p-type conductive metal over the p-type layer (col. 11, lines 7-15 & Fig. 14), etching the p-type metal and p-type GaN layer and active layer to expose the n-type GaN layer and depositing an n-type metal over the n-type GaN layer (col. 11, lines 17-19 & Fig. 14). The process further comprises forming scribe lines by applying an IRE dry etching process to either side of the substrate and through any layer deposited over the substrate (col. 5, lines 33-37). The substrate is polished and etched to define a

specific thickness (col. 9, lines 5-11). All the layers are deposited by epitaxial deposition. (col. 7, lines 40-45).

Carvantes et al. discloses the additional use of mirror elements within the diode but does not disclose the deposition of a reflective layer over the bottom surface of the substrate. Carvantes et al. also does not specify the roughness of the substrate and the size of the scribe lines.

Tomomura et al. teaches forming a light emitting device comprising a substrate whereupon an n-type layer and active layer and a p-type layer are deposited, wherein p-type and n-type metals are deposited over the p-type and n-type layers respectively (col. 7, lines 1-67), and wherein a reflective layer is deposited on the back side of the substrate. (col. 7, lines 60-67)

It would have been obvious to one having ordinary skill in the specific art to combine the teachings of Tomomura et al. to the invention of Carvantes et al., since, as taught by Tomomura et al., depositing a reflective layer over the bottom surface of the semiconductor substrate will result in a device that emits a light of higher luminance. (See Tomomura et al. col. 7, lines 60-67).

Furthermore, it would have been obvious to one having ordinary skill in the art to define the preferred roughness of the substrate and scribe line sizes, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Also, it has been held that a change in size is generally

recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renzo Rocchegiani whose telephone number is (703) 308-5839. The examiner can normally be reached on Monday through Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached at (703) 308-1323. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318.

RNR

February 7, 2003


MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800